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February 25, 1956

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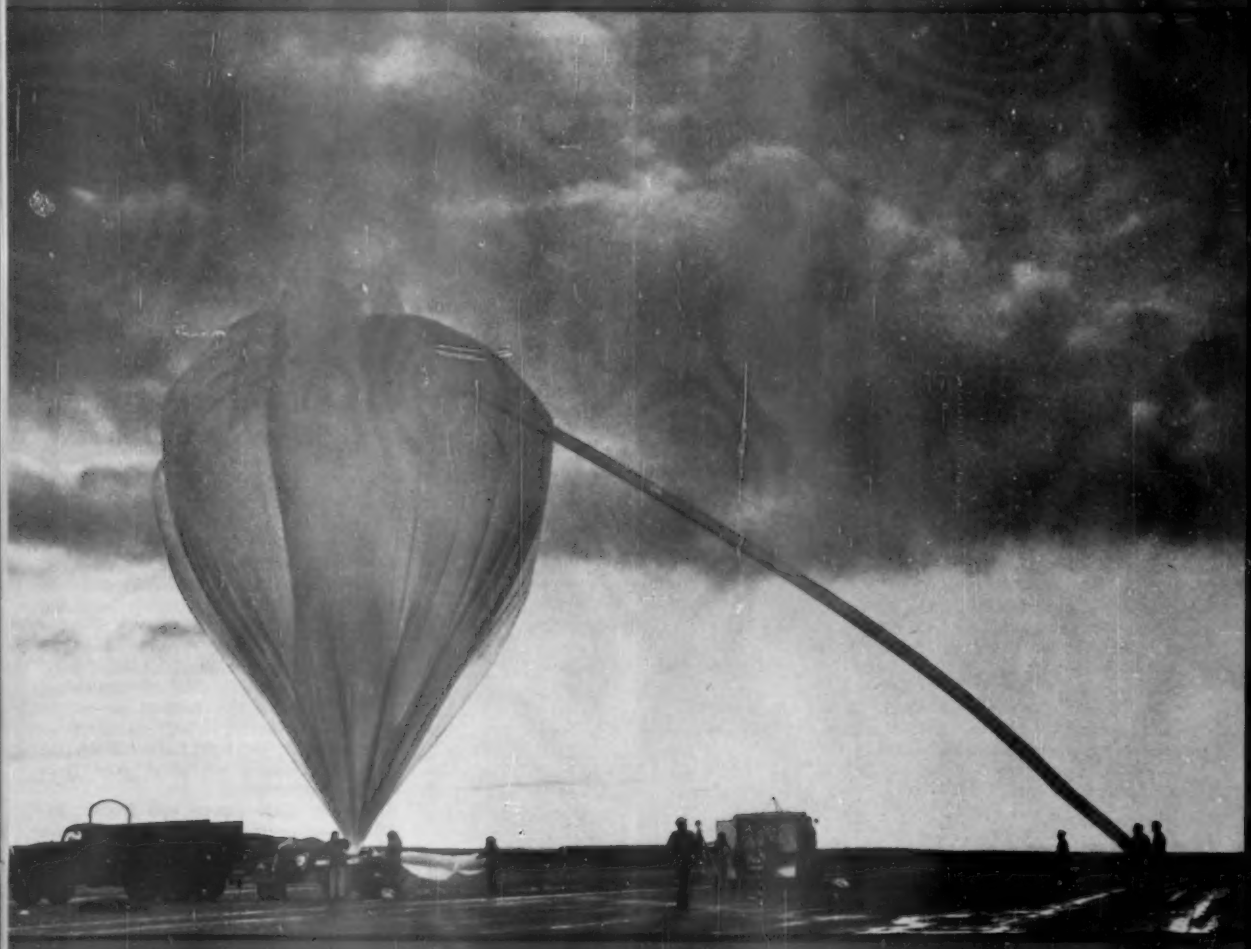
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Weather Probe

See Page 117

A SCIENCE SERVICE PUBLICATION

AERONAUTICS

Ram Jet Planes by 1966

➤ PASSENGER PLANES powered by ram jet engines and capable of speeds reaching 1,900 miles per hour will be produced in France within the next ten years.

This was the optimistic prediction made by a French rocket expert at a conference at the German Research Institute for the Physics of Jet Propulsion, Freudenstadt, Germany. Jacques Dupin of the National Aircraft Construction Society of the North expects the planes will fly at two and one-half to three times the speed of sound and at altitudes of from 60,000 to 90,000 feet.

He also reported that turbojets would assume a "secondary role" in some airplanes in the "near future," and would be used as boosters for the ram jet-powered aircraft.

Atomic Rockets Foreseen

➤ ATOMIC ROCKETS using light elements propelled with great heat will be more efficient than the liquid-fuel rockets used in high altitude research today, it was predicted by Dr. Eugen Sanger, director of the German Research Institute for the Physics of Jet Propulsion.

Although there is no practical application of this type of rocket at the time being, Dr. Sanger is strongly convinced of its feasibility.

They would enable higher exhaust speeds than chemical propelled rockets for the same temperature in the combustion chamber.

"The great advantage of the thermal atomic rocket will be that one can use two different substances, one for energy production and the other for exhaust," he said. "In the chemical-propelled rocket, both are inevitably the same."

Exhausted gases in a chemical rocket have a high molecular weight, while in a thermal atomic rocket, any gas with a low atomic weight, like hydrogen, could be used.

The lower atomic weights would mean faster exhaust velocities and, therefore, greater top speeds for rockets within the temperature range that can be handled in combustion chambers.

Airplane Boosters

➤ A STARTING DEVICE for airplanes, the hot water rocket, which produces thrust by emitting steam from a high-pressure vessel through an exhaust nozzle, was described at the meeting.

Dr. Christian Seebohm, the German Minister of Transport, said German research had reduced the operating costs of the hot water rocket from $25 per ton per second to 12 cents per ton per second. This will probably be decreased still further to two cents.

W. Michely of the Institute, who made the calculations and carried out experiments with this new take-off assistance, is convinced hot water rockets can compete with solid and liquid-propelled boosters in every respect.

He expects the actual fuel expenditures to be almost a fiftieth of that of other liquid-propelled rockets.

Although some early experiments were done on hot water rockets during World War II by a research team in Germany, this is the first time reliable information has been gained on the feasibility of this type of booster.

The scientists concerned with the project do not suggest, however, connecting hot water rockets with the airplanes for easing their take-off. Their idea is to put the plane onto a wagon, which would be accelerated by hot water rockets up to a velocity where ram jets could take over. The plane would then take off, leaving the wagon behind.

French Research Rocket

➤ THE FRENCH liquid-propelled research rocket "Veronique" has reached an altitude of 81 miles, the conference was told.

The rocket development center at Vernon, France, reported the rocket, designed to carry scientific instruments, is propelled by a mixture of nitric acid and alcohol.

A modified model of the "Veronique" is expected to reach an altitude of 162 miles.

The U. S. Army's Corporal rocket has gone as high as 250 miles.

Science News Letter, February 25, 1956

MEDICINE

Antibiotic Fights Resistant Diseases

➤ AN ANTIBIOTIC that fights diseases resistant to older antibiotics has been discovered.

The new antibiotic, trade-named Bryamycin, was found by Bristol Laboratory scientists in New York in soil from Hawaii.

In laboratory tests, Bryamycin was found to be active against gram-positive bacteria that cause such diseases as pneumonia, meningitis and endocarditis. Two deadly germs the new antibiotic fights are *Micrococcus pyogenes* and *Diplococcus pneumoniae*, both of which have developed strains resistant to older mold remedies once effective against the diseases.

In reporting the discovery, M. J. Cron, a Bristol scientist, said mice were protected against streptococcal and diplococcal infections, whether the antibiotic was given 18 hours before or six hours after the infection.

The Bristol research team included D. F. Whitehead, I. R. Hooper, B. Heinemann and J. Lein.

Science News Letter, February 25, 1956

• RADIO

Saturday, March 3, 1956, 2:05-2:15 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service over the CBS Radio Network. Check your local CBS station.

Dr. Walter O. Roberts, director of the High Altitude Observatory of the University of Colorado, Climax, Colorado, will discuss "The Halo of the Sun."

GEOPHYSICS

Italians to Propose European Satellite

➤ THE ITALIAN ROCKET SOCIETY will propose to the European nations that they sponsor an earth satellite program.

The proposal will be made at the annual convention of the International Astronautical Federation to be held in Rome in September, Dr. C. Partel, adviser to the Italian Rocket Society, told SCIENCE SERVICE.

Representatives of 20 countries will attend the one-week September meeting. Special attention will be given to the problems of space jurisdiction, Dr. Partel said.

It is a problem both the United States and Russia are facing in their satellite programming, he stated.

Other problems to be tackled are the technical aspects of both the U. S. satellite project and a manned flight to the moon.

Science News Letter, February 25, 1956

BIOLOGY

Man-Killing Jellyfish Is Right- or Left-Handed

➤ THE PORTUGUESE MAN-OF-WAR is either right-handed or left-handed.

The difference, which possibly helps the giant, man-killing jellyfish to survive, is reported in *Nature* (Feb. 11) by Drs. A. K. Totton of the British Museum, London, and G. O. Mackie of the University Museum, Oxford.

Under the influence of the wind, the British scientists state, the left-handed jellyfish moves to the right of the downward direction and the right-handed one to the left. This movement in only one direction with the wind, they state, has survival value in that it prevents an entire brood from washing up on shore.

At birth, Drs. Totton and Mackie explain, it seems the two forms, which are alike in every other way, divide almost equally between right- and left-handers.

Originally, it was thought the Portuguese man-of-war in the Southern Hemisphere mirrored the one in the Northern Hemisphere, thus accounting for the right- and left-handedness.

It has been found, however, Drs. Totton and Mackie state, "that the proportion in which the two forms are found varies in particular localities not according to the hemisphere but according to the position of adjacent land and the direction of the wind."

Science News Letter, February 25, 1956

MEDICINE

Sulfa Pill for Diabetics

Some diabetics may be able to swallow pills, drugs still in the research stage, instead of taking insulin injections if tests at many hospitals are successful.

➤ PILLS for diabetics have now been fashioned from sulfa drug relatives.

For some diabetics, but by no means all, the pills may do away with the need to take injections of insulin.

The pills, however, are not a complete insulin substitute. They do not work unless there is some insulin in the body. Patients whose bodies produce some although not enough insulin may be helped. The drugs seem to act as insulin enhancers.

The drugs are still in the experimental stage. Manufacturers as well as doctors testing them agree on this. None of them is yet on the market commercially or available in drug stores in the United States.

Some medical men stress these new diabetic pills should be given only in hospitals where patients can be watched and tested regularly to be sure they can safely omit their insulin shots.

Tests of the new sulfa pills for diabetics are under way at the University of Pittsburgh Medical School, Michael Reese Hospital in Chicago, Deaconess Hospital in Boston and other medical research centers both in the United States and abroad.

Elderly diabetics are the ones now considered most likely to be helped by the new pills. Younger patients have been less helped, though a few have been able to take smaller does of insulin while taking the sulfa pills.

The pills lower the amount of sugar in the blood and the sugar in the urine disappears. The pills are not a cure, even for those in whom they are effective. The patient must go on taking them regularly, but of course swallowing pills every day is much easier than injecting insulin every day.

The blood sugar-lowering effect of the new sulfa drugs was discovered in more or less routine tests of the new compounds. Unlike earlier sulfa drugs, these newer ones have no germ-stopping, or anti-bacterial action.

How the new pills act is not known. The islets of Langerhans in the pancreas produce insulin. Two kinds of cells, alpha and beta, exist in this tissue. According to one theory the sulfa pills stimulate the beta cells to produce insulin. According to another, they act by damaging the alpha cells which produce glucagon. Glucagon raises the level of sugar in the blood. A third theory is that the sulfa pills act by both damaging alpha cells and stimulating formation of new beta cells.

One of the new sulfa pills for diabetes has been given the name Orinase, though it is not yet on the market. Chemically it is tolylsulfonyl butyleria. It was synthesized at the German laboratories of Farberwerk-Hoechst, Frankfurt on-the-Main.

French scientists have worked with other sulfa pills for diabetes. First one to be reported in scientific literature has the name of para-amino-benzene-sulfonamido-isopropyl-thiodiazole.

Science News Letter, February 25, 1956

MEDICINE

Half of Doctors Agree With Ike

➤ PRESIDENT EISENHOWER has half the nation's doctors agreeing with him politically, it appears from an American Medical Association survey.

The survey, by an independent research agency (Ben Gaffin and Associates, Chicago) was not primarily a political one. It was made to learn what people like and do not like about doctors so the profession can try to improve its services.

Among those questioned for the survey were 500 doctors, and among the questions were some on A.M.A. political activities.

In this connection, the A.M.A. report states: "Incidentally 50% of all doctors say that Dwight Eisenhower's political philosophy comes closest to their own, 26% choose Robert Taft's and 17% prefer Franklin Roosevelt's."

Other findings of the survey:

Half the public, 51%, is satisfied with present health insurance plans, while 53% of doctors say the plans are not adequate.

Doctors (82%) are critical of advance press reports of new drugs, while 45% of the public approves, 35% disapproves of such reporting.

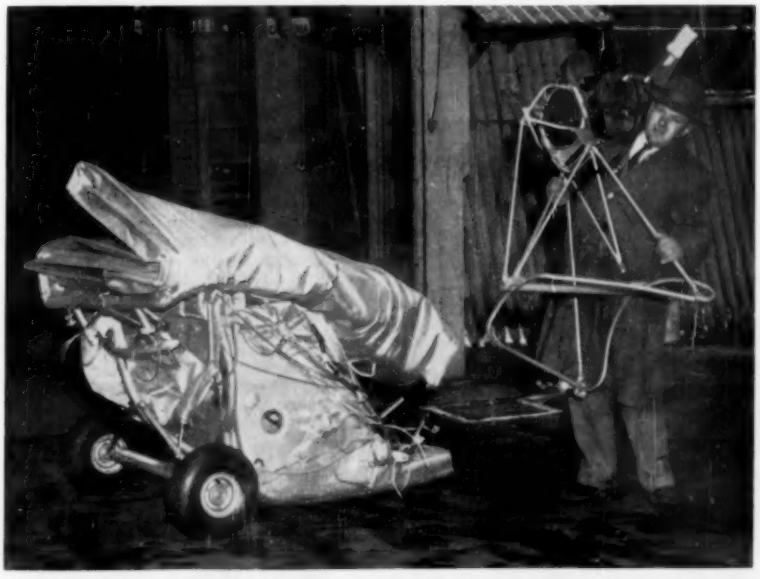
A fourth of the people who know the A.M.A. and half the doctors think a few doctors run the organization.

In spite of much publicity about fee-splitting, about half the public, 54%, admit not knowing what it is. Of those who know exactly or approximately what it is, half say the problem has been exaggerated. With this, four out of five doctors agree.

The public and the doctors agree that hospital and drug bills have risen faster than doctors' bills since World War II. The fact is, comments the A.M.A. report, that hospital bills have been increasing at the sharpest rate of the three.

Labor, material and equipment costs and general inflation are blamed mainly for increased medical costs by both doctors and public.

Science News Letter, February 25, 1956



INFLATABLE AIRPLANE—With wing and tail assemblies folded over the inflated seat section, the remainder of this inflatable airplane, its engine and tubular support, is shouldered by Roger L. Wolcott, an engineer at Goodyear Aircraft Corporation where the craft was developed. The plane, constructed primarily of rubberized fabric, is made rigid with less air pressure than is required to pump up an ordinary car tire.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

➤ **Recercas de Poliomyelitis.**—Es reportate ab Chicago que un femina in le acute stadio de poliomyelitis parturiva, in le pulmon de aciero, un infante sin ulle signo apparente del morbo de su matre. In omne previe casos de parturition per patientes de poliomyelitis in stadio acute, le neonatos exhibiva symptomas del morbo e demonstrava assi que poliomyelitis es transferibile ab le matre al embryon in su utero. Le presente caso demonstra que le embryon pote reager al infection poliomyelitic per le disveloppamento de anticorpores protective.

➤ **Physiologia.**—Hamsters congelate pro periodos de un hora e plus esseva disgelate e resuscitate sin ulle apparente mal effecto in experimentos executate per Dr. Audrey Smith al Instituto National de Recercas Medical a London in Anglaterra. Dr. Smith predice que le durantia del "congelation sin morte" pote esser prolongate irrestringitemente in le caso de hamsters e que ultimemente un simile procedura va devenir possibile etiam pro humanos.

➤ **Pischeria.**—In transportar colonias de pisces ab un laco al altere, le servicio canadian de pischeria se ha servite con successo de un simple methodo a anestheticos e glacie. In loco de transportar le pisces in le enorme tanks que esserea requirite pro provider le pisces de satis aqua e satis oxygeno, le expertos canadian ha anesthesiate lor pisces (super toto varie species del familia *Esox*) per medio de urethano e ha impacchettate los in stato inconscie sub coperturas de glacie. Esseva constatate que le pisces supervive completemente intacte a iste typo de transporto durante periodos de cinque horas e plus.

➤ **Astronautica.**—Pro simular le conditiones que futur astronaves va deber supportar, le fabrica General Mills Inc. a Minneapolis ha construite un "camera de spatio" in que varie materiales es subjicite al collision con invisibile particulas viagiante a velocitates de 30.000 km per hora e plus. Omne materiales nunc disponibile se disintegra post prolongate exposition al conditiones del "camera de spatio." Plus immediate objectivos del recercas in le "camera de spatio" es trovar o disveloppar e probar le melior materiales pro le construction de satellites terrestre artificial.

➤ **Physica Atomic.**—Dosages maximal de irradiation atomic—i.e. dosages post que le vita del victima es ancora salvabile—reduce le superviventia median de animales experimental per 25 pro cento, secundo observationes facite per Dr. H. A. Blair del Universitate Rochester. On crede que simile relationes vale etiam pro humanos. Un minus lugubre resultato del recercas de Dr. Blair es que 20 continue annos de exposition al dosage maximal de irradiation currentemente admittite pro travaliatores in le industria atomic reducerea lor vita per non plus que 2,5 pro cento.

➤ **Physiologia.**—Un chirurgo e un dentista de Chicago ha discoperite un frappante correlation del occurrentia de curvaturas spinal e deformitates dental. Quando le curvature spinal es congenite o un sequela de poliomyelitis, le correlation con deformitates dental es minus pronunciate o mesmo absente. Isto pare indicar que le co-existentia del duo debilitates es causate per un sol factor disveloppamental o crescential.

➤ **Psychologia Animal.**—Es reportate ab Australia que circa 400 juvene balenas ha natate verso le costa in un baia in le vicinitate de Dunalley in Tasmania. Le balenas habeva un longor de inter 3 e 8 m. In le pauco profunde aqua del baia le balenas non poteva respirar proque lor diaphragmas esseva pressate contra le fundo. Illos moriva. Piscatores de Dunalley tentava remolcar los al oceano aperte pro salvar los, sed illos reveniva al costa—obediente, il pare, un irresistibile impulso suicidal. Le phenomeno del suicidio in massa de juvene balenas ha previemente essite observate, sed illo remane sin explication.

➤ **Physiologia.**—Un interrelation de sexo e temperatura esseva constatate per Dr. J. Bouillon de Brussel in Belgica pro le specie gastropodic *Cepea nemoralis L.* Iste creatura es hermaphrodite, i.e. illo es capace a simultaneemente producer cellulas spermatic e ovos. Secundo Dr. Bouillon, *C. nemoralis* exhibi nulle activitate sexual a temperaturas vicin a 0° C. In le vicinitate de 6° C., illo produce ovos sed nulle sperma. Finalmente, in le vicinitate de 20° C., illo produce e ovos e sperma, sed le ovos producite a tal temperaturas non pote maturar.

➤ **Epidemiologia.**—Le Bureau Sanitari Pan-American predice que febre jalne va invader Mexico intra alicun menses o al plus un anno. Iste prediction se basa super le reporto de simias moriente ab febre jalne in Guatemala a un distantia de minus que 150 km ab le frontiera mexican. On interpreta le situation como periculose pro le integre territorio in que le mosquito *Aedes aegypti* existe e es preste a disseminar le morbo.

➤ **Psychologia.**—On recognosce de plus in plus que le si-appellate quotiente intellectual non mesura vermente le intellecto sed le un o le altere dexteritate que es un aspecto specialisate del intellecto. Proque le tests traditional mesura satis exclusivemente le dexteritate verbal, on ha supplementate los per tests de dexteritate manual. Isto non satisfaceva le psychologo Dr. H. N. Hoffman del Universitate New York. Ille ha disveloppate tests non-verbal e non-manual que mesura le capacitate de conciper dimensiones, symmetria, profunditate, spissitate, e altere elementos de forma concrete. Certes inter iste tests monstra un satis bon grado de correlation con le tests intellectual traditional, sed in certe alteres le correlation es completemente absente.

➤ **Algicultura.**—Esseva accordate duo patentes statounitese concernite con le cultura de *Chlorella* que va possibilemente devenir un importantissime ressource de alimentation human e animal. Le prime de iste patentes concerne le combination de nitrogeno fixe con minerales e micro-nutrientes in le ambiente aquose de *Chlorella* que resulta in le production maximal de proteina, lipidos, e hydratos de carbon. Le secunde patente concerne le optime dimensiones del receptaculos algicole. Le possessores de iste patente ha observate que le productivitate de algas es un function del forma del tanks in que illos cresce. Lor patente protege le resultatos de un exacte studio de iste phenomeno.

➤ **Physiologia.**—Depost 1952 il es cognoscite que un del differentias biochimic inter le duo sexos es le presentia de chromatina in le nucleos de cellulas feminin. Es nunc reportate que le mesme differentia characterisa etiam le cellulas in le liquido in que le feto es suspendite durante le periodo de gestation. Le problema del prediction del sexo de un infante non ancora nascite esserea consequentemente solvite, si le obtention de specimens del liquido mentionate non esseva frequentemente impossibile.

SCIENTIA INTERNATIONAL appears monthly. Send this page to non-English-speaking friends.

GENERAL SCIENCE

Atomic Energy Study Being Sold as Book

➤ PROBABLY the most up-to-date and complete textbook on atomic energy is being sold by the U. S. Government Printing Office.

The book is Volume 2 of the "Report of the Panel on the Impact of the Peaceful Uses of Atomic Energy" made to the Joint Congressional Committee on Atomic Energy (see SNL, Feb. 18, p. 108.)

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METEOROLOGY

See Farmers Fleeced

Some commercial rainmakers may ignore "if" clauses in report to President that rainfall can be increased up to 17% under certain conditions in Pacific Coast areas.

➤ FLEECING FARMERS, particularly in the Midwest, of hundreds of thousands of dollars may well be the short-range effect of a report to the President that rainfall can be increased nine percent to 17% under special circumstances.

Some commercial rainmakers, hoping to make a quick profit, could point to these official Government figures as assurance their cloud-seeding operations will work, conveniently ignoring the many "if" clauses also included in the report.

Although the President's Advisory Committee on Weather Control concluded precipitation can be increased somewhat by throwing silver iodide into certain kinds of clouds, this applies only to specific Pacific Coast areas.

Prospects for making rain or snow in other parts of the country are considerably less promising.

One difficulty in settling the question of whether man can change rainfall amounts is lack of knowledge of, or adequate theory to predict, what would have occurred if there had been no seeding.

Using statistical averages can help overcome this difficulty, but then the problem becomes one of how to select the pertinent figures and how to manipulate them.

Results different statisticians obtain with the same set of figures have been known not only to differ, but to be opposing.

This can be particularly true when dealing with data concerning weather. Also records are often inadequate for proper analysis.

An aid in solving the problem would be to seed clouds or not seed them according to instructions drawn up using the impartial laws of chance. Prospects are not good, however, for persuading commercial operators and the farmers and public utilities companies who pay them to adopt this method, which many scientists believe is the only one that will some day solve the problem.

Other Government agencies and universities under contract to them have seeded or not seeded clouds in their experiments according to the laws of chance. Evaluations of such experiments in the United States have not shown results that could be definitely traced to the seeding.

The Advisory Committee has so far limited its studies to commercial operations, but is expected soon to start re-evaluation of public experiments, conducted for shorter time periods than the commercial ones.

The group was set up to recommend to the President and to Congress the extent to which the Federal Government should experiment with, engage in or regulate attempts to increase precipitation or otherwise affect the weather. It is headed by Capt. Howard T. Orville, retired Naval officer now affiliated with Fricz Instrument Division of Bendix Aviation, Baltimore.

Science News Letter, February 25, 1956

MEDICINE

Artery Hardening In All Mammals

➤ ALL MAMMALS apparently suffer from hardening of the arteries.

The typical thickening of the arteries in arteriosclerosis has been found in such diverse species as dogs, cats, lions, tigers, elephants, birds, horses, cows, baboons, gorillas and llamas.

In some of the species coronary attacks bringing death have been observed, followed by finding microscopic lesions on the arterial wall.

Demonstration of arteriosclerosis in all of the above named species has been made by Dr. Stuart Lindsay, pathologist in the University of California School of Medicine. Dr. Lindsay presented his results at the meeting of the Pacific Coast Section of the Society for Experimental Biology and Medicine in San Francisco. The session was dedicated to the late Dr. James F. Rinehart, professor of pathology in the School.

Dr. Lindsay obtained many of his arterial tissues from zoo keepers over the country and abroad. The gorilla was "Bushman," and the elephant was "Marge" of the San Francisco zoo, both of whom died of heart attacks.

The pathologist said that arteriosclerosis became worse with age in all animals.

The scientist also said that the lesions always started with deterioration of the interior lining of the blood vessel, the intima, followed by deposition of mucoid substances on the points of deterioration. There was little or no deposition of fatty material, even late in the disease.

Fatty deposits did not seem to play a role in death in the animals. Death came, rather, from the primary mucoid lesions.

Although fatty deposits do not seem to be important in animals and are not involved in the early stages in man, they are important in the later stages and in causing death in man.

Until recently it was conceded that the fatty deposits started the disease as well as caused nearly all of the blood vessel thickening.

Science News Letter, February 25, 1956

JET PART OF FUTURE—This lacy honeycomb of metal will be used as the core of jet engine components of the future. It will be produced at one facility of General Electric's new aircraft propulsion development laboratories at Evendale, Ohio.

METEOROLOGY

Improve Balloon for Recording Weather

See Front Cover

➤ AN IMPROVED version of balloons used to record upper-air weather data is shown on the cover of this week's SCIENCE NEWS LETTER as it is being inflated with hydrogen gas through a 90-foot long sleeve.

Such balloons are widely used by the Weather Bureau, Air Force and Navy to gather meteorological data from high altitudes.

One of the Navy's, launched from Oppama, Japan, was blown off course about mid-February and floated the wrong way, drifting over Siberia instead of the Pacific.

Russia had previously protested that the United States was launching the balloons loaded with radio equipment and cameras for "spying" behind the Iron Curtain.

Secretary of State Dulles denied the charge, and the U. S. told the United Nations that the protests were "based on misconstruction of facts."

The U. S. statement said balloons that happened to drift over Russia were used only for meteorological purposes.

Air Secretary Donald A. Quarles also denied the charge. He said photographic and radio equipment carried by some of the balloons was solely to meet research needs.

Washington observers suggested the Russian protest was a move to confuse weather reconnaissance balloons with low-flying leaflet balloons sent over Iron Curtain countries by a non-governmental agency.

Science News Letter, February 25, 1956

GENERAL SCIENCE

Science Summer Schools

Grants from National Science Foundation, industry and private foundations will allow about 2,000 science teachers to attend summer school institutes across the country.

➤ ABOUT 2,000 SCIENCE TEACHERS in all parts of the nation will attend institutes to enrich their instructional abilities at nearly 50 colleges this coming summer.

Between five percent and ten percent of the total number of high school teachers who give their major time to science teaching will have the opportunity to attend.

About half of the summer institutes are being financed by grants from the National Science Foundation. Others are supported by industry and private foundations.

The rapidly growing program, much increased this year, is expected to enhance the quality of science teaching and to be a practical aid in providing science-motivated youth for research and industry.

Some of the summer institutes will be for high school teachers and others for college teachers.

Most of the institutes will be held in June, July and August, and will run four weeks, although some run twice as long. Many teachers attending will receive stipends, and some travel and living allowances.

In many cases, credit for advanced degrees can be obtained at the institutes.

In addition, some science teachers take courses in various college summer schools to advance themselves professionally.

Sessions for high school teachers, sponsored by the National Science Foundation, will be held at:

Alabama College, Montevallo, Ala., Science

American University, Washington, D. C., Physical Sciences

University of Arkansas, Fayetteville, Ark., Natural Sciences

University of Indiana, Bloomington, Ind., Biology

Iowa State Teachers College, Cedar Falls, Iowa, Mathematics

Marshall College, Huntington, W. Va., Physical Sciences

Montana State College, Bozeman, Mont., Chemistry

Oak Ridge Institute of Medical Studies, Oak Ridge, Tenn., Physical Sciences

Pennsylvania State University, University Park, Pa., Science

University of Rochester, Rochester, N. Y., Physics

University of Utah, Salt Lake City, Utah, Biology

Wesleyan University, Middletown, Conn., Science

Williams College, Williamstown, Mass., Mathematics

University of Wyoming, Laramie, Wyo., Physics

Institutes for high school teachers supported by other agencies will be held at:

Agricultural and Mechanical College of Texas, Texas College Station, Tex., Industry sponsored, Physics

Carnegie Institute of Technology, Pittsburgh, Pa., Westinghouse sponsored, Mathematics, Physics and Chemistry

Case Institute of Technology, Cleveland, Ohio, 30 Du Pont summer fellowships, Science and Mathematics

Case Institute of Technology, Cleveland, Ohio, General Electric sponsored, Modern Physics, Electronics, Organic Chemistry, Principles of Chemistry

Colorado College, Colorado Springs, Colo., Science Teaching for Modern Society

Columbia Teachers College, New York, N. Y., 12 Du Pont summer fellowships, Science and Mathematics

Cornell University, Ithaca, N. Y., Shell sponsored, Science Teaching, Mathematics, Physics, Chemistry

University of Delaware, Newark, Del., 12 Du Pont summer fellowships, Science and Mathematics

George Washington University, Washington, D. C., Physical and Biological Sciences

Harvard University, Cambridge, Mass., 20 Du Pont summer fellowships, Science and Mathematics

Howard University, Washington, D. C., Phelps-Stokes Fund sponsored, enrollment limited to holders of Phelps-Stokes fellowships, and limited number of local teachers, Science and Mathematics

Massachusetts Institute of Technology, Cambridge, Mass., Westinghouse sponsored, Mathematics, Physics and Chemistry

University of Minnesota, Minneapolis, Minn., Hill Foundation sponsored, Mathematics, Physics and Chemistry

University of North Carolina, Raleigh, N. C., 16 Du Pont summer fellowships, Science and Mathematics

Ohio State University, Columbus, Ohio, 16 Du Pont summer fellowships, Science and Mathematics

Oregon State College, Corvallis, Ore., Crown Zellerbach Foundation sponsored, National Science Teachers Association operated, limited to Washington, Oregon, California, Idaho, Utah, Nevada and Arizona

Purdue University, Lafayette, Ind., General Electric sponsored, Modern Physics, Organic Chemistry, Principles of Chemistry

Rensselaer Polytechnic Institute, Troy, N. Y., General Electric sponsored, Modern Physics, Organic Chemistry, Principles of Chemistry

Rutgers University, New Brunswick, N. J., Science Teaching

St. Louis University, St. Louis, Mo., 16 Du Pont summer fellowships, Science and Mathematics

Stanford University, Palo Alto, Calif., Shell sponsored, Science Teaching, Mathematics, Physics and Chemistry

Syracuse University, Syracuse, N. Y., General Electric sponsored, Modern Physics, Electronics, Organic Chemistry, Principles of Chemistry

University of Texas, Austin, Tex., Science and Mathematics

Union College and University, Schenectady, N. Y., General Electric sponsored, Modern Physics and Chemistry

Wesleyan University, Middletown, Conn., 12 Du Pont summer fellowships, Science and Mathematics

For college teachers, National Science Foundation supported institutes will be held at:

American Society for Engineering Educators at Argonne National Laboratory, Chicago, Ill., Nuclear Energy for Staff of Engineering Colleges

Botanical Society of America at Cornell University, Ithaca, N. Y., Botany

Indiana University, Bloomington, Ind., Chemistry

University of Michigan, Ann Arbor, Mich., Mathematics

Montana State College, Bozeman, Mont., Chemistry

Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tenn., Physical Science

Oregon State College, Corvallis, Ore., Chemistry

University of Utah, Salt Lake City, Utah, Biology

Williams College, Williamstown, Mass., Mathematics

Wisconsin State College, Eau Claire, Wis., Astronomy for Staff of Teachers Colleges

University of Wyoming, Laramie, Wyo., Physics

Science News Letter, February 25, 1956

BIOCHEMISTRY

Female Hormones Speed And Check Tissue Growth

➤ FEMALE HORMONES both speed and check normal tissue growth, depending on whether they are acting alone or together. Latest evidence for this includes a study of the fourth and most recently discovered naturally occuring female hormone, 16-epi-oestriol.

The study is reported in the *Proceedings of the Society for Experimental Biology and Medicine* (Dec., 1955) by Drs. Joseph T. Velardo and Somers H. Sturgis of Harvard Medical School and Peter Bent Brigham Hospital, Boston.

The fourth female hormone was discovered just a few months ago by Drs. G. F. Marrian and W. S. Bauld of the University of Edinburgh, Scotland.

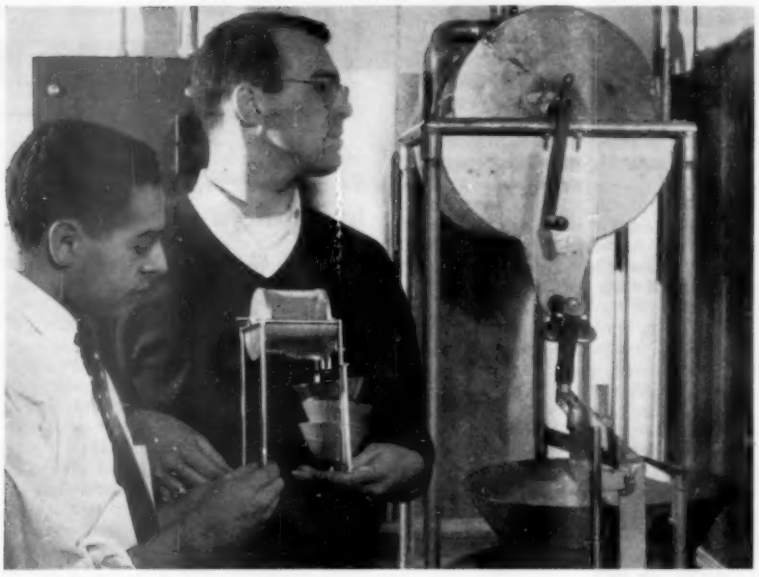
The Harvard research finding is said to have a possible bearing on both malignant and non-malignant growths.

The new hormone is found only in human females during pregnancy. It checks the normal, expected growth of the uterus in rats, restricting the activity of another female hormone, estradiol. It has very weak growth-stimulating activity.

Normal tissue growth is believed to result from a definite ratio between growth-promoting and growth-checking substances.

Besides estradiol, the two other naturally occurring female hormones known to stimulate uterine growth in rats are oestrone and oestriol. Dr. Velardo had previously found that combinations of these two and estradiol resulted in less growth than any one of them alone produced. Now he and Dr. Sturgis find that the fourth, epi-oestriol, is no exception.

Science News Letter, February 25, 1956



MOSQUITO EGG EXTRACTOR—Two members of the University of Illinois entomology department, Moufied Moussa, Cairo, Egypt, and Jaques Berger, Philadelphia, Pa., are shown comparing an exact scale model of the Illinois mosquito egg extractor with the actual machine. Through a special process, the machine is able to extract mosquito eggs, the size of soot specks in a coal pile, from soil samples.

SURGERY

Safer Heart Operations

➤ SURGEONS will be able to operate on the heart safely for much longer periods with a simplified, inexpensive, throw-away artificial lung announced at the meeting of the Society of University Surgeons in Indianapolis.

The new lung consists of a series of plastic bags. It was reported by Dr. Ivan W. Brown Jr. of Duke University. With it, he and his associates at Duke have been able to operate on human hearts for as long as two and a half hours.

Time may be virtually eliminated as a major factor in future heart surgery with the aid of this new lung that lets the blood bypass the heart.

During an operation, while the heart is by-passed, blood is pumped from the body by a special electric finger pump into the "lung" where carbon dioxide is removed, oxygen is added, and the blood is pumped back into the circulatory system.

Meanwhile, a flow of blood through the coronary arteries "feeds" the heart muscle sufficiently to keep it alive, but does not interfere with surgery. Two operating room assistants "monitor" the blood flow by weighing the plastic bags on scales before the blood is pumped back into the body.

The new lung apparatus overcomes a major problem of blood clotting and "blood damage" encountered in most other devices (because of blood being altered during contact with surfaces of the materials used). A special film coating in the Duke apparatus prevents "frothing." The surface of the plastic bags and tubes also prevents any damage to various elements of the blood.

In attacking the problem, Dr. Brown said, "We considered the following requirements to be essential: freedom from dependence on mechanical or electronic devices; simplicity and hand operation; freedom from bacterial contamination; smooth-non-wetting surfaces throughout, preventing as far as possible damage to various blood elements; rapid and efficient enough to provide sufficient flow rates; and low cost and expendability.

"From laboratory and limited clinical experience, we feel that the blood-gas exchanger (artificial lung) fills these requirements and offers certain other advantages not inherent in most oxygenators," he said.

Science News Letter, February 25, 1956

A new *dictionary* compiled and printed automatically by an electronic "brain" is used as a source for naming new drugs.

Properly processed *cottonseed meal* is suitable for feeding to poultry and hogs, thus opening a new market to the product.

CHEMISTRY

Clear Up Mystery Of How Iron Rusts

➤ STEPS IN RUSTING of iron have been made clearer by purposeful corrosion of stainless steel.

Gradual solution of the protective surface of stainless steel samples in dilute sulfuric acid was found suddenly to give way to rapid corrosion at a definite electrical potential at about minus 0.4 volt, followed by a recovery process described as "ennobling."

Radioactive isotopes of iron and copper were used to follow the formation and solution of surface films on the special steel. The study, made by Dr. G. H. Cartledge of the chemistry division, Oak Ridge National Laboratory, Oak Ridge, Tenn., is described in a preliminary report in *Nature* (Jan. 28).

So completely does the new study explain the rusting and recovery processes that Dr. Cartledge is now able to start the ennobling process, if it is delayed, by any one of five methods. Earlier studies on corrosion have also had some puzzling features cleared up by this new research.

Science News Letter, February 25, 1956

MEDICINE

Set Standards for Blood Vessel Banks

➤ STANDARDS for establishing and running community blood vessel banks have been set up by the American Heart Association.

The banks would serve patients who need to have a piece of artery cut away and replaced in conditions ranging from gangrene-threatening clots in leg blood vessels to removal of cancers that have invaded blood vessels.

Radioactive cobalt 60 and high voltage cathode rays are methods recommended for sterilizing the blood vessels after removal from dead bodies and before deposit in the banks.

Quick freezing and simultaneous freezing and drying are presently accepted methods for preserving the blood vessels.

Synthetic grafts, made of plastic, nylon, orlon, dacron and vinyon "N" cloth, when used under proper conditions have given satisfactory early results, but the recipient's reaction to these over a long period of time is unknown.

The blood vessel bank standards are issued as "recommendations" by a committee of the American Heart Association and appear in the association's scientific journal, *Circulation* (Feb.)

The committee consisted of Dr. Jere W. Lord Jr., University Hospital, New York; Dr. Robert E. Gross, The Children's Hospital, Boston; Dr. Charles A. Hufnagel, Georgetown University, Washington, D. C., and Dr. Abel A. Lazzarini Jr., New York University Postgraduate Medical School, New York.

Science News Letter, February 25, 1956

MEDICINE

Find Artery Hardening In Two-Week-Old Babies

➤ INFANTS apparently begin to develop hardening of the arteries right after birth.

Blood vessel thickening of arteriosclerosis has been found in babies only two weeks old, but is not found in unborn infants.

For a period of three months after birth, blood vessel thickening continues at a rate that would kill at the end of a few years. But after three months, the process is slowed or reversed, and other studies show that hardening of the arteries proceeds gradually thereafter into old age.

These are some of the findings Dr. Henry Moon, pathologist at the University of California School of Medicine, presented at a symposium of the Pacific Coast Section of the Society for Experimental Biology and Medicine in San Francisco. The symposium was dedicated to the late Dr. James F. Rinehart, a pathologist at the school.

Dr. Moon examined arteries of human fetuses, infants ranging up to a year, and young people up to 20 years of age. All died suddenly, usually from accidents. None had histories of heart disease, or lingering illnesses.

If there had been no arteriosclerosis, the intima, or inner lining of the arterial wall, would hardly be measurable — perhaps a couple of cells thick at the age of three months. But Dr. Moon found this lining was almost as thick as the rest of the wall forming the coronary arteries, many times the thickness of a couple of cells, at the age of three months.

Why hardening of the arteries should appear right after birth and why birth should be the dividing line cannot yet be explained, Dr. Moon said.

Simply because the process is universal and develops even in the very young is no proof that it is normal, he noted.

Science News Letter, February 25, 1956

PHYSICS

Device Takes X-Rays In Millionth of Second

➤ A DEVICE that takes X-rays in a millionth of a second and a microscope that takes pictures of atoms were reported to the American Physical Society meeting in New York.

Dr. W. P. Dyke of Linfield College, McMinnville, Ore., said he had stabilized the emission of electrons from tungsten to generate so many X-rays they can be photographed in a millionth of a second.

Such X-rays could be used to study everything from how a pilot's bones react when he goes through a 20-g bank to a bullet as it is fired from a barrel, blanketed by smoke and invisible by usual photographic methods.

The device resulted from studies made by Drs. Dyke and J. K. Trolon, also of Linfield College, of how electrons evaporate from tungsten in layers only one atom thick by a process known as field emission. Their studies use electrons, whereas those reported by Dr. E. W. Muller of Pennsylvania State University use ions, or electrically charged atoms.

Dr. Muller showed physicists pictures of atoms he is taking almost daily with his field ion microscope. Using them, scientists can actually observe atomic structure instead of depending on theory for knowledge of how atoms in solids are arranged, as they previously had to do.

The pictures confirm that atomic structures based on theory are accurate.

The device, heavily insulated to preserve the required low temperatures, operates at very high voltages, and resembles two thermos bottles, one inside the other.

Within the vacuum is a fine tungsten wire, its tip, 1,000 times finer than a pin tip, coated with the substance to be studied. The tip's surface, greatly magnified, shows up on a fluorescent screen. For studying chemical reactions and the formation of alloys, the metal of which the tip is made can be changed or different elements can be put on the tip.

When atoms or molecules of a foreign substance strike the needle, the electron emission from the areas they hit is changed from the characteristic pattern the plain needle emits.

Science News Letter, February 25, 1956

BOTANY

Allergy Drugs Used to Probe Photosynthesis

➤ PYRIBENZAMINE and benadryl, the allergy drugs sometimes prescribed for sniffles and colds, are now being used to investigate the mystery of photosynthesis.

Dr. Jean Gross, University of California at Los Angeles zoologist, has found that these antihistamine drugs destroy chlorophyll in plant-like, single-celled animals known as *Euglena*. Under microscopic examination the chloroplasts, site of photosynthesis, seem to shrink and become indistinguishable from other cellular particles in the presence of the antihistamines.

The action also seems to affect other biological functions of the organisms. Although they continue to reproduce, their rate of multiplication is altered, as is their nutrition.

New organisms produced in the presence of the drug were found to contain no chlorophyll. The chlorophyll does not regenerate in these organisms when they are placed in an antihistamine-free medium.

A better understanding of this bleaching effect by antihistamines may tell us more about the general relationship between chloroplasts and chlorophyll, both of which are involved in photosynthesis, Dr. Gross said.

It also may tell us how these tiny organisms between the plant and animal world acquired photosynthetic ability.

Science News Letter, February 25, 1956

IN SCIEN

MEDICINE

Baby Gets Polio Immunity Before Birth

➤ IF AN EXPECTANT MOTHER gets polio, her unborn child may get enough of the virus to develop immunity, even though the baby when born shows no signs of having polio.

That this can happen is shown by a case reported by Drs. Alexis Shelokov and Karl Habel of the National Institutes of Health, Bethesda, Md., in the *Journal of the American Medical Association* (Feb. 11).

The case is believed the first on record of a baby born without outward signs of polio although born while its mother was in the acute stage of the disease. A number of cases of paralytic polio developing in a baby before birth have been reported.

The present case added to these others confirms the idea doctors have had for some years that an unborn child can be infected with polio virus through the maternal tissues that surround and nourish the baby before birth.

It shows also that the mechanism for developing antibodies was well established, at least in this baby, before birth.

The baby was born while its mother was in an iron lung in Walter Reed Army Hospital, Washington, D. C. The baby was perfectly normal and remained so. The mother was out of the iron lung about three weeks after the baby's birth, but had so much remaining weakness in both legs, one hand and her back that she had to be transferred to a rehabilitation center.

Science News Letter, February 25, 1956

TECHNOLOGY

Test Materials for Space Flight Use

➤ A "SPACE CHAMBER" to test how metals and other materials withstand conditions found hundreds of miles above the earth's surface is operating in Minneapolis, Minn.

Materials that may be used in artificial satellites and space ships of the future are bombarded by invisible charged particles moving at speeds of Mach 25, or about 20,000 miles an hour.

Even the best presently available metals disintegrate, or "sputter" away, under prolonged attack, scientists at General Mills, Inc., have found.

Special properties are required for materials to be sent to the outer atmosphere, research in the "space chamber" has shown. The momentum and angle at which the charged particles strike the material under test determine its disintegration rate.

Science News Letter, February 25, 1956

CE FIELDS

TECHNOLOGY

Uranium Dwarfs Gold In South African Mines

➤ URANIUM PLANTS refining and concentrating uranium ores at the West Rand Consolidated Mines in South Africa are now larger than the older gold mining installations for which the area is known.

This new development in uranium production was announced by Albert B. Mindler, chemical engineer of the Permutit Company, New York. With Dr. A. H. Greer and J. P. Termini, he reported on ion exchange processes by which 95% to 96% of the uranium can be recovered from its ores.

The ion exchange process for uranium recovery has only recently been cleared under security regulations, although the process itself, which is similar to one process for water softening, has been in use for a number of years.

Not only Africa, but Australia, Canada and the United States are using the process in uranium refining, the chemists told the session of the Delaware Valley regional meeting of the American Chemical Society, Philadelphia.

Science News Letter, February 25, 1956

ASTRONOMY

Creation of Earth in First Year of Expansion

➤ CREATION of the earth and other planets began in the first year after the universe started expanding.

Creation of the sun came after, not before, the beginning of earth's formation.

This reversal of previous theories about the evolution of the universe is suggested by Dr. David Layzer of Harvard College Observatory, Cambridge, Mass.

Little specks of matter combined to form larger ones, gradually growing into clumps from which planets, stars and galaxies evolved. Dr. Layzer calls this build-up process "clustering."

It started when the universe began to expand, according to the Einstein theory, after reaching the highest possible nuclear density, about one million billion grams per cubic centimeter.

The solar system would have formed within a year, when the mean density of matter in the universe was about what it is now in the solar system, Dr. Layzer said.

During the approximately four billion years since that time, very shortly after the universe started to expand, the "clustering" has continued until now it is galaxies which are becoming clumped.

The universe contains millions of galaxies like the Milky Way, in which the sun is but one of billions of stars.

Dr. Layzer's theory, highly mathematical, completely contradicts that of continuous creation, which holds that matter and stars are being formed all the time.

Dr. Layzer reached his conclusion about small masses gradually growing into larger ones from a study of how double stars, which make up about half of all stars, could have come into being.

He reasoned that if matter was once packed much closer together, formation of such a high percentage of double stars would follow naturally. Other theories have serious drawbacks.

Most theories of star formation in the last 50 years assume stars are formed by a breakdown, or "fragmentation" process. Large masses break up into smaller, self-gravitating ones, which in turn break up into even smaller ones until stars and planets are formed.

Science News Letter, February 25, 1956

BIOLOGY

Predicts Rip Van Winkles May Be Real in 50 Years

➤ SUCCESS in restoring frozen hamsters to life leads an English scientist to hope the same can be done for humans.

The scientist is Dr. Aubrey Smith of the National Institute for Medical Research, London. On the basis of her experiments, she made the following prediction:

"Perhaps in 50 years, the stories of Rip Van Winkle and the Sleeping Beauty will no longer be fantasy."

Dr. Smith believes many people considered dead after air and sea accidents in frozen areas of the world might have been brought back to life. She has frozen golden hamsters and restored them to life an hour after their breathing and heart-beats have stopped.

"The stopping of heart-beats does not mean an animal is dead," she said.

"Who knows that it might not also be true of humans? When pilots and seamen are in accidents in frozen areas, it is often difficult to locate them. They might be exposed for a long time before being found. Instead of giving them up for dead, I think one should have a shot at resuscitation, as we have done successfully with animals."

In her laboratory, Dr. Smith seals the golden hamsters in a glass jar. As they keep breathing the same air, they become drowsy and fall asleep. Then they are gently cooled and packed in crushed ice. An hour later they are thawed and brought back to normal. Tests show that they suffer no damage to the brain. For a day or two they lose their appetites; that is all.

By treating certain organs with glycerine, Dr. Smith hopes the animals can be stored in a completely frozen state indefinitely. If so, they would still be alive, and no older, when eventually thawed out.

Science News Letter, February 25, 1956

TECHNOLOGY

Device Focuses Infrared Radiation on Oil Film

➤ A UNIQUE INSTRUMENT that makes it possible to see in the dark has been shown publicly by Baird Associates, Inc., Cambridge, Mass.

The device, which has no electronic circuits, is called an evaporograph, nicknamed EVA. With it a man 200 yards away or a house a mile distant can be seen in total darkness.

Key to the instrument is that different materials radiate varying intensities of infrared, depending upon their temperatures and surfaces. This radiation is always present, and can be detected from a distance of several miles.

In operation, the evaporograph is similar to a camera. It collects radiation from an object and focuses it as an image on an oil film. The oil then evaporates away from each point at rates varying with the amount of radiation received. When viewed in reflected light, these differences in oil film thickness appear as different colors, as oil films on water do.

A thermal picture of the view is thus obtained in color. This picture can be viewed directly or photographed with a camera incorporated in the apparatus. The unit, designed to observe radiation from one to several thousand degrees Fahrenheit, is sensitive to two-tenths of a degree, Baird Associates states.

Science News Letter, February 25, 1956

GEOLOGY

Bending Gravestones Challenge Geologists

➤ HUNDRED-YEAR-OLD gravestones in the Grove Street Burial Ground, New Haven, Conn., which are bending with the weight of years, have attracted the attention of Yale University geologists.

Made of marble which, local tradition says, came from Italy as ballast in sailing ships, the tall thin stones are found throughout the cemetery. The curvature of some is toward the grave, of others away from it.

Some stones are warped sidewise as well, forming a dish-shaped hollow sometimes as much as two feet across. The bending usually affects only the lower half of the tombstone.

Curved stones are more usual among the markers dated around 1830 and 1850, although one stone dated 1884 is curved five degrees. The amount of bending does not seem related to the stone's age.

Force of gravity aided by weathering is held accountable by Harald Drewes, E. T. Ruppel and F. G. Lesure of Yale's geology department, who report their examination of the stones in the *American Journal of Science* (Feb.). Although explaining the flexibility of the stones, the scientists note this theory does not completely explain the saucer-like warping.

Science News Letter, February 25, 1956

ASTRONOMY

Jupiter Rivals Venus

Mars, approaching earth, is on view early mornings, and will brighten to eight-tenths of a magnitude by March's end. Year brings closest brush of earth and Mars since 1924.

By JAMES STOKLEY

➤ WITH THE COMING of March, the planet Venus continues to brighten and climb higher into the evening sky.

Soon after the sun goes down, and before any other star or planet appears, it can be seen as a brilliant jewel in the west. At the middle of the month it is some 60 times brighter than a typical first magnitude star.

Another planet, Jupiter, rivals Venus, for it is about a fifth as bright—still far more brilliant than any other star or planet. Both of these shining orbs are shown on the accompanying maps, where the sky is depicted as it looks about ten o'clock, your own kind of standard time, at the first of March; about 9:00 p.m. on the 15th and 8:00 p.m. on the 31st.

Venus is in the constellation of Aries, the ram, while Jupiter, high in the south, stands among the stars of Leo, the lion.

Jupiter is seen just to the right of a part of Leo called the sickle, because the stars are arranged in the form of this implement. Regulus, a star of the first magnitude, is at the end of the handle, which points downward, while the blade curves around so that it points toward the southwest.

Ten First Magnitude Stars

Altogether, ten first magnitude stars are visible on March evenings, more than at any other time of year.

Below Leo is Virgo, the virgin, in which we see Spica. Although first magnitude, in its present position on account of the absorption of its light in passing through the atmosphere, it appears somewhat fainter.

To the left of Virgo is Bootes, the bear-driver, in which we find Arcturus. Another way to locate this bright star is to look in the northeast for the big dipper, part of Ursa Major, the great bear.

The dipper is now inverted, and the pointers, which are in the bowl, indicate the direction of Polaris, the pole star, which is only of the second magnitude. If you follow the curved line of the dipper's handle toward the south, it will bring you to Arcturus.

The most brilliant stars of the evening sky appear in the southwest, where we can still see the array that shone so brightly in the southern evening sky in January.

There is Orion, the warrior, a group which contains two stars of the first magnitude. These are Betelgeuse and Rigel, which can be seen, respectively, above and below the three stars that make up the belt of Orion.

To the left, and a little lower, is Canis Major, the greater dog, with Sirius, the dog star, brightest that we can see in the evening sky.

It is still many times fainter than either Venus or Jupiter, but these are not stars but planets, which shine by reflected sunlight. The stars, in contrast, are far distant suns, each shining by its own light.

Above Canis Major is the lesser dog, Canis Minor, with Procyon, and still higher we find Pollux, one of the twins, in the constellation of Gemini. A little farther around to the right is Auriga, the charioteer, with Capella.

Below this is Taurus, the bull, with a star distinctly red in color, Aldebaran, to mark the animal's eye. Just below Taurus is Aries, in which Venus now stands.

Saturn Appears at Midnight

About midnight another planet, Saturn, appears in the southeast, in the constellation of Scorpius, the scorpion. It is a little fainter than Procyon, although brighter than Aldebaran.

By about 3:00 a.m. Mars has come into view above the southeastern horizon, in the constellation of Sagittarius, the archer, where it will remain during the month. Its distance from the earth will decrease from 146,239,000 miles on the first to 121,627,000 miles on March 31.

On the first its magnitude is 1.2, about the same as Pollux, but at the end of March it will brighten to 0.8 magnitude, an increase of nearly 50%.

During spring and summer it will come still nearer until September, when it will be 35,120,000 miles away, nearer than it has been since 1924.

This month's full moon comes on March 26. Observed at that time the so-called "seas" are easily visible. These are the dark markings that form the face of the "man in the moon," and the other fanciful figures people have imagined they saw there.

Actually there is no water on the moon; these were called seas by Giovanni Battista Riccioli, an Italian astronomer who thought there was. In 1651 he published his great work, known as the "Almagestum Novum," or the "New Almagest." The original Almagest was a famous astronomical work written about the second century, A. D., by Claudius Ptolemaeus of Alexandria.

Fanciful Names for Seas

For his book, Riccioli made some very fine engravings of the moon, as well as a map of its features as seen through his telescope.

The seas he gave rather fanciful names, such as Sea of Rains, which is one of the largest, the Sea of Clouds, the Sea of Tranquility, the Marsh of Sleep and the Lake of Dreams. All these names are still used by lunar observers.

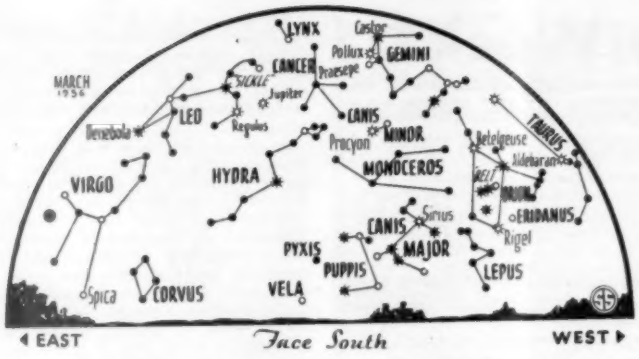
The eye of the face of the "man in the moon" to the right is formed by the Sea of Tranquility and the other eye by the Sea of Rains. The Sea of Clouds is his mouth.

Craters Visible With Binoculars

About March 19, when the moon is at first quarter, one can easily see that the edge of the sunlit portion is not entirely smooth. Looking through a small telescope, or even a good pair of binoculars, some of the larger craters become visible.

These are far larger than any volcanic craters on earth. Some are well over a hundred miles in diameter.

In his map, Riccioli named these craters after famous astronomers of his time and earlier, not forgetting to put himself there



☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

as well as his friends. There are so many craters on the moon that he could not see all of them with his early telescope, and he missed some that were large enough for him to observe.

Since then, other astronomers have published books on the moon and accompanying maps. With better optical equipment, they have been able to observe more objects, and to designate them more names have been added.

Following the example of the Italian pioneer, these have generally been named after astronomers, explorers and other scientists.

Benjamin Franklin has a crater, so does Charles T. Yerkes, the Chicago millionaire who gave the money for the Yerkes Observatory of the University of Chicago. This institution, which opened in 1895, has the largest refracting telescope in the world, with a 40-inch lens.

James Lick, who established the Lick Observatory of the University of California, also has a crater.

Large, New Moon Map

One of the important events in astronomical circles in the past year has been the publication of a new book on the moon, by two English astronomers, H. P. Wilkins and Patrick Moore, who have observed the moon through several of the world's great telescopes. (See SNL, Dec. 17, 1955, p. 396.)

Their map, 300 inches in diameter, and printed in sections in the book, is perhaps the most complete yet issued, and their descriptions of the features make the work one that should remain authoritative for a long time to come.

Like their predecessors, they have taken advantage of their opportunity to add some new names, 99 in all. One is Fisher, after Clyde Fisher, first director of the Hayden Planetarium in New York, who died in 1949.

Another is after Bernard Lyot, a French astronomer who developed a method of photographing the sun to show its outer layer, the corona, without waiting for a total eclipse.

Several Arctic and Antarctic explorers, Nansen, Shackleton, Peary, Amundsen and Scott are now on the moon. Appropriately, they have craters near the lunar poles.

Frederick E. Wright, who made observations of the moon from the Mt. Wilson Observatory, gets a crater. So does Russell W. Porter, an amateur astronomer of Vermont, who aided thousands of other amateurs in making their own telescopes. Later he helped plan and build the 200-inch Hale telescope on Mt. Palomar. Albert G. Ingalls, former editor of *Scientific American*, now retired, who spread knowledge of Porter's work in books, also has a crater.

Both Wilkins and Moore themselves are on the map, but they got on the moon prior to the publication of this new book.

There are still many features on the moon that have no special name, so perhaps there is still hope for others to be added to this distinguished list.

However, the big ones are all taken, and future people who want lunar craters will have to be content with small ones perhaps only a few miles in diameter.

Celestial Time Table for March

March EST

3	9:44 a.m.	Moon passes Saturn
4	6:53 a.m.	Moon in last quarter
6	12:11 a.m.	Moon passes Mars
	8:00 a.m.	Moon farthest, distance 251,500 miles
10	2:07 a.m.	Algol, variable star in Perseus, at minimum brightness
12	8:36 a.m.	New moon
	10:56 p.m.	Algol at minimum
15	7:46 p.m.	Algol at minimum
	10:41 p.m.	Moon passes Venus
19	12:13 p.m.	Moon in first quarter
20	10:21 a.m.	Vernal equinox (beginning of spring in Northern Hemisphere)
21	7:00 p.m.	Moon nearest, distance 229,200 miles
23	9:41 a.m.	Moon passes Jupiter
26	8:11 a.m.	Full moon
30	5:55 p.m.	Moon passes Saturn

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, February 25, 1956

NATURAL RESOURCES

Oilmen and Miners Agree To Respect Each Other

➤ OIL OPERATORS are not going to drill on top of potash miners and potash miners are not going to mine under the drillers any more in southeast New Mexico.

In the past, in Eddy and Lea counties of New Mexico where oil and potash reserves are found together, both miners and drillers have thought the others' operations presented a danger to them.

Secretary of the Interior Douglas McKay has now reported that both parties working with the U. S. Geological Survey and other agencies have agreed that no mining would be conducted where it would endanger oil operations and no drilling would take place where it would endanger mining operations.

Science News Letter, February 25, 1956

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE ANALYTICAL THEORY OF HEAT—Joseph Fourier, translated, with notes by Alexander Freeman—*Dover*, 466 p., paper, $1.95. A republication of the English translation of this classic, which first appeared in 1878.

THE COMPARATIVE ENDOCRINOLOGY OF VERTEBRATES: Part II, The Hormonal Control of Water and Salt-Electrolyte Metabolism in Vertebrates—I. Chester Jones and P. Eckstein, Eds.—*Cambridge University Press*, Memoirs of the Society for Endocrinology, 124 p., illus., $4.75. Proceedings of a conference held at the University of Liverpool July, 1954.

THE COST OF THE NATIONAL HEALTH SERVICE: In England and Wales—Brian Abel-Smith and Richard M. Titmuss—*Cambridge University Press*, 176 p., $5.50. Showing what the National Health Service has cost in England and Wales between July, 1948, and March, 1954, and identifying some of the more important factors that have determined costs during this period.

EDUCATION AND EMPLOYMENT SPECIALIZATION IN 1952 OF JUNE 1951 COLLEGE GRADUATES—E. Eleanor Rings—*Gov't Printing Office*, National Science Foundation, 78 p., paper, 35 cents. More than two-thirds of the respondents in the survey reported they were employed in 1952, and the majority indicated their employment was "education-related."

EPITOME OF THE PHARMACOPEIA OF THE UNITED STATES AND THE NATIONAL FORMULARY: With Comments—Council on Pharmacy and Chemistry of the American Medical Association—*Lippincott*, 10th ed., 322 p., $3.00. This edition has been designed to serve as a companion volume to *New and Nonofficial Remedies*, also issued by the AMA Council on Pharmacy and Chemistry.

FOLLOW THE WHALE—Ivan T. Sanderson—*Little, Brown*, 423 p., illus., $6.00. Stone Age men of the North Sea left records of having hunted the whale. This is the beginning of the fascinating story of whalers and whales, which the author traces down through the ages to the present day.

A FURTHER CONTRIBUTION TO THE ORNITHOLOGY OF NORTHEASTERN VENEZUELA—Herbert Friedmann and Foster D. Smith Jr.—*Smithsonian*, Proceedings of the U. S. National Museum, 62 p., illus., paper, free upon request direct to publisher, Washington 25, D. C.

GEOMETRY OF FOUR DIMENSIONS—Henry Parker Manning—*Dover*, 348 p., illus., cloth $3.95, paper $1.95. Republication of a book originally published by Macmillan in 1914.

GREEN FACTORIES—Eva L. Gordon—*New York State College of Agriculture*, Cornell Rural School Leaflet, 31 p., illus., paper, 20 cents. Explaining the workings of photosynthesis and showing that most living things are dependent on this process.

INTRODUCTORY QUANTITATIVE CHEMISTRY—Axel R. Olson, Charles W. Koch and George C. Pimentel—*Freeman*, 470 p., illus., $5.00. This text includes the contents of *Introductory Quantitative Analysis*. However, the emphasis has been broadened in recognition of the fact that quantitative measurement provides the cornerstone for all the sciences.

LEARNING ABOUT TESTS—Joseph C. Heston—*Science Research Associates*, Junior Life Adjustment Booklet, 40 p., illus., paper, 50 cents. Written to help students learn how to study for tests and how to take tests so they may make better grades on their examinations.

THE MIGHTY FORCE OF RESEARCH—Editors of Fortune—*McGraw-Hill*, 308 p., illus., $4.00. Telling of the men and organizations involved in scientific research, which has developed into a four-billion-dollar-a-year business.

NATIONAL BUREAU OF STANDARDS ANNUAL REPORT 1955—A. V. Astin, Director—*Gov't Printing Office*, U. S. Dept. of Commerce Miscellaneous Publication 217, 175 p., illus., paper, 55 cents.

PHYSICAL ORGANIC CHEMISTRY—Jack Hine—*McGraw-Hill*, 497 p., illus., $9.00. Dealing with the formation of carbon compounds by polar reactions, with free-radical reactions, and with four-center-type rearrangements.

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY: Volume 2, Physics; Research Reactors—*United Nations (Columbia University Press)*, 471 p., illus., $8.00. Includes all information developed at the Geneva Conference on the background physics and the construction and operation of research reactors. Detailed features of each power reactor type are covered in Volume 3 (See SNL, Jan 14, p. 30.)

PROCEEDINGS OF THE NINTH ANNUAL CONFERENCE ON THE ADMINISTRATION OF RESEARCH—T. H. Vaughn, Chairman—*New York University Press*, 107 p., paper, $4.00. Records of a meeting held at Northwestern University Technological Institute, Evanston, Ill., Sept. 7-9, 1955.

PSYCHOLOGY OF INDUSTRIAL CONFLICT—Ross Stagner—*Wiley*, 550 p., illus., $8.00. Attempting to systematize and apply the principles of social psychology relevant to industrial conflict.

SCIENCE AS A SOCIAL INSTITUTION: An Introduction to the Sociology of Science—Gerard DeGré—*Doubleday (Random House)*, 48 p., paper, 85 cents. Bringing into focus several interrelated philosophical, moral and sociological problems in the field of the sociology of science which is, according to the author, the investigation of the way in which society and science reciprocally influence one another.

SCIENTIFIC PERSONNEL RESOURCES: A Summary of Data on Supply, Utilization and Training of Scientists and Engineers—National Science Foundation—*Gov't Printing Office*, 86 p., illus., paper, 50 cents. This volume marks the completion of the first phase of a continuing study of the scientific and technical manpower situation being made by the National Science Foundation.

TOOLS IN YOUR LIFE—Irving Adler—*Day*, 128 p., illus., $2.95. Telling for children the story of man's use of tools from early times to the present.

THE TORMENT OF SECRECY: The Background and Consequences of American Security Policies—Edward A. Shils—*Free Press*, 238 p., $3.50. Interpreting the significance of our security and loyalty policies of the past ten years in the "light of the tasks and traditions of American life and the principles of the free society."

YOU AND TV—Robert Stollberg—*Science Research Associates*, 55 p., illus., paper, 60 cents. Giving some of the basic principles of how and why television works.

Science News Letter, February 25, 1956

BIOLOGY

Use Mice to Study How Emotions Affect Cancer

➤ WHETHER A WOMAN'S EMOTIONS, such as frustration over being denied motherhood, can play a part in causing cancer is being studied by a new method devised by Dr. Freddy Homburger of the Tufts University School of Medicine, Boston, in collaboration with A. Tregier of Tufts and H. S. Grosman, now of Washington University, St. Louis. The method was announced by the American Cancer Society.

Cancer of the breast frequently attacks spinsters and married women without children, the Society explains. Women with cancer of the uterine cervix, that is, the neck of the womb, often have a history of sex relations and child bearing at an early age and marital difficulties marked by divorces and separations.

Scientists have speculated whether emotions aroused by such situations and possible hormone changes are involved in the development of the cancers.

To try to answer this question, Dr. Homburger and associates use the womb of the mouse. The neck of the womb is tied off, so that hormones and other chemicals collecting in it can be analyzed periodically. When the womb is untied, the mouse is perfectly able to bear normal offspring.

Estrogen, ovarian hormone that makes uterine tissues grow, steps up the growth rate of transplanted cancers, the scientists have found. Progesterone, the hormone which prepares the uterus to hold the fertilized egg, slows the growth rate of transplanted cancers.

Uterine secretions make cancer transplants to the mouse uterus take in 100% of cases, instead of the usual 70%, but the cancers grew very slowly.

Besides studying the effects of hormones, the scientists are studying the effect on development of transplanted cancers in mice and on mouse uterine secretions of regular mating, unsatisfied sexual excitement and sexual isolation.

Science News Letter, February 25, 1956

GEOLOGY

Last Ice-Age Ice Covered Milwaukee

➤ GLACIAL ICE hundreds of thousands of feet thick buried Milwaukee, Wis., until 10,700 years ago.

Exact dates and rates of movement of the last ice age to blanket North America have been determined by Dr. Richard F. Flint, professor of geology at Yale University, New Haven, Conn.

Using carbon-14 dating methods, he found that the last big ice push, 10,700 years ago, covered from Duluth, Minn., across the Great Lakes to Lake Champlain, New York.

The glacier moved down on the United States at a rate of about 960 feet a year. It stopped finally at Milwaukee, and after a few hundred years began retreating.

By 8,200 years ago, he said, it had receded to the vicinity of Green Bay, Wis., 170 miles north of Milwaukee. Its retreat was at the rate of 345 feet a year. By 6,500 years ago the ice had melted from all the Great Lakes region.

Tests also showed, Dr. Flint stated, that glacial ice covered the area northwest of Hudson Bay as recently as 4,000 years ago.

Science News Letter, February 25, 1956

BIOLOGY

NATURE RAMBLINGS

by Horace Loftin

Naming the Animals

➤ PROBABLY the last time the common names of animals were in anything resembling order was very shortly after Father Adam first passed them out. The mix-up of names certainly began long before work was interrupted on the Tower of Babel, for people in general have a genius for calling animals by the wrong name or adding new ones.

Scientists have done a pretty good job in a difficult situation by applying standard scientific names to all the known species. But when it comes to the problem of what name to call the young, the male, the female and the group (for instance, herd and flock) of a given species, they generally throw in the towel.

The reason is understandable. For instance, did you know that the little fellow riding on mama toad's back in the picture is a "bullhead?"

Here is a quiz to test your own knowledge of "common" animal names. Answers are found following each group of questions.

Name the animals whose young are sometimes called: 1. stirk; 2. scrod; 3. eyas; 4. squealer; 5. brit; 6. stot; 7. kit; 8. graul; 9. teg.

Answers: 1. cattle 2. cod, haddock; 3. falcon; 4. grouse, partridge, quail pigeon; 5. herring; 6. horse, ox; 7. muskrat, mink; 8. salmon; 9. sheep.

What is the name of the young of the: 1. chimpanzee; 2. jack-rabbit; 3. green turtle; 4. whale?

Answers: 1. infant; 2. kitten; 3. chicken; 4. calf.

What do you call a: 1. female falcon; 2. female fish; 3. female owl; 4. male red deer; 5. male sandpiper; 6. female swan; 7. male terrapin?

Answers: 1. haggard; 2. hen; 3. jenney howlet; 4. hart; 5. ruff; 6. pen; 7. bull.

If your score wasn't very high, don't let it worry you. This is one quiz that the quizmaster failed, too.

Science News Letter, February 25, 1956

ICHTHYOLOGY

Calm Fish in Transport By Using Anesthetics

➤ FISHERY BIOLOGISTS in Canada are using anesthetics and freezing temperatures to quiet sports fishes being transferred from lake to lake, the Canadian Wildlife Service reports.

In moving pickerel and pike over 40 miles of road in the Prince Albert National Park last summer, the big fish were placed in canvas tanks containing a dilute solution of urethane, an anesthetic. The hardier northern pike took about twice as long as the pickerel to lose consciousness.

When they were "out," the fish were bedded in chipped ice in wooden containers, ready for the overland trip to their new homes. The fish were kept unconscious for up to five hours.

Fins of the fish were clipped, and some of the marked fish were caught in gill nets a few days after their release. They appeared to be none the worse for their "knock out" treatment.

Active fish being transported require a large supply of well-oxygenated, cool water, an expensive, hard-to-obtain order for carrying fish from lake to lake in most areas. By shipping the fish in an anesthetized condition, packed in ice, cost and equipment are held to a minimum, insuring the arrival of the fish in excellent condition.

Science News Letter, February 25, 1956

BIOLOGY

One-Celled Plant Life

➤ PHYTOPLANKTON, microscopic floating marine plant life, may hold the key to the food supply of the human race when the soil's productivity has become insufficient to nourish world populations.

The most efficient producers of food known to man, these minute algae are being studied by Dr. Ruth Griffith, assistant professor of biology at Hood College, Frederick, Md.

Working under the auspices of the Maryland State Department of Research and Education, Dr. Griffith is preparing an illustrated key to the types and relative numbers of the common phytoplankton to be found in the estuaries of the lower Chesapeake Bay.

Although speculation about this potential source of human nourishment is widespread, the work of Dr. Griffith and other scientists in assembling ecological information about the phytoplankton is a necessary forerunner of experiments in methods of gathering and using the one-celled green plants as food.

Of more immediate value is the possibility of a relationship between the phytoplankton and oyster populations of the Chesapeake Bay. Infant oysters, in the form of free-swimming larvae, fasten themselves at one stage of their development to old oyster shells on the bottom.

Oystermen, to increase and localize oyster yields, drop old shells into the water to serve as setting places for the maturing oysters, the so-called "spat." If dropped too soon before the larvae are ready to set, the shells become covered with dirt and debris, sponges and other organisms, and cannot serve as setting places.

If the shells are dropped too late, the larvae have already passed the stage where they become spat and presumably die.

If scientists can, as they hope, discover some correlation between the population of phytoplankton, the larval oysters' food supply, and the population of oysters ready to set as spat, they will be able to tell oystermen the best time for dropping shells in the water and will thereby take the guesswork out of oyster seeding.

Twice weekly during last summer Dr. Griffith strained three 100-liter samples of bay estuary water and counted and classified the algae that she found by this method. Samples since summer have been collected once monthly.

This frequent testing of the water of the bay has as its immediate goal determination of how various physical and chemical conditions of the water affect the presence of the tiny green plants.

Dr. Griffith experimented with the phytoplankton of Lake Michigan before beginning her Chesapeake Bay research.

Science News Letter, February 25, 1956

Questions

ASTRONOMY—When does Mars make its closest approach to earth in more than 30 years? p. 122.

□ □ □

BIOLOGY—What is a possible reason for jellyfish being left- or right-handed? p. 114.

□ □ □

GEOLOGY—Why do some gravestones bend? p. 121.

□ □ □

MEDICINE—When does arteriosclerosis start? p. 120.

□ □ □

TECHNOLOGY—What installations are dwarfing gold mines in South Africa? p. 121.

□ □ □

Photographs: Cover, U. S. Air Force; p. 115, Goodyear; p. 117, General Electric Company; p. 119, University of Illinois; p. 128, Eastman Chemical Products, Inc.

· New Machines and Gadgets ·

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 819. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

PREFAB CHIMNEY made of striated aluminum sheet looks like wire-cut brick. Complete with an extension that resembles a flue tile, the chimneys are available in three sizes: a single housing 18 by 18 inches square, a rectangular housing 18 by 36 inches, and a double housing.

Science News Letter, February 25, 1956

DRAFTING MACHINE is an imported, Swedish-made instrument for performing any graphic operation requiring a T-square and triangle. The steel and plastic device holds any angle and its complement. The protractor head reads from 90 through 0 to 45 degrees with automatic quick-set lock every 15 degrees.

Science News Letter, February 25, 1956

CONCRETE REPAIR material of latex-cement is designed for the do-it-yourself patching of cracks or holes in walls, concrete or cement floors, walks, etc. The kit includes ten pounds of the cementing material and setting agents, plus a quart of milk-white liquid rubber latex.

Science News Letter, February 25, 1956

PULL TOY known as Happy the Horse, shown in the photograph, is designed for toddlers. With no sharp or rough edges, the polyethylene plastic animal is an arrangement of hearts, ABC's and hollow balls that serve as wheels. As it is pulled, bells in the wheels tinkle.

Science News Letter, February 25, 1956

TOASTER ACCESSORY keeps buns, cookies, crackers and toast warm at the table. The stainless steel tray fits most pop-up toasters, and is placed atop the toaster.

Science News Letter, February 25, 1956

ELECTRAULIC LIFTER for one-man operations has a load capacity of 1,000 pounds. Equipped with a ¾ horsepower motor, the lift height is five feet, eight inches. The lift speed is 15 feet per minute. The 455-pound lifter has a 24-by-24 inch platform.

Science News Letter, February 25, 1956

PIANO ACCORDION molded of styrene plastic is a junior-sized model toy. There are 52 hand-tuned brass reeds controlled by nearly an octave and one-half of piano keys on the treble side, and bass buttons for two single notes and two chords. It comes with carrying-case and instruction book.

Science News Letter, February 25, 1956

RADIAL ARM SAW for the home workshop is a nine-inch portable power saw that operates on a ¾ horsepower motor. The saw is described as capable of ripping beyond the center of a 48-inch panel, cross-cutting a one-by-15-inch board and cutting two and one-half inches in depth. It has a dual voltage motor and a turret arm.

Science News Letter, February 25, 1956

Do You Know?

More than 30 pounds of *aluminum* are used in each automobile.

The average person eats his weight in *food* every six to eight weeks.

The three most important varieties of symptoms and signs associated with *brain tumors* are headaches, fits and disturbances in speech.

The nation's *coal* resources are estimated to be over 2,000 billion tons, and a substantial share of these resources are located in the states adjoining the upper Ohio River.

Benjamin Franklin conceived the idea and established the first permanent subscription library, mother of all free circulating libraries, and he assisted an organized campaign to establish the Pennsylvania Hospital for the sick and insane.

In 1955, *mice* replaced rats as the nation's foremost animal pest.